AMENDMENTS TO THE CLAIMS

1. (Canceled)

2. (Canceled)

3. (Canceled)

4. (Currently amended) The computer implemented method of analyzing a physical signal from a physical device comprising the steps of:

a. inputting the physical signal;

b. extracting a set of Intrinsic Mode Functions from the physical signal;

c. generating a set of mean frequency functions from the Intrinsic Mode Functions, wherein the step of generating a set of mean frequency functions includes computing the mean frequency at a point along the time scale for one of the Intrinsic Mode Functions and continuing to perform the computing step for all of the Intrinsic Mode Functions ; and,

d. displaying said set of mean frequency functions.

5. (Currently amended) The computer implemented method as in claim , wherein the mean frequency at a point under consideration is **a weighted mean frequency.**

6. (Canceled)

7. (Currently amended) The computer implemented method as in claim4, wherein extracting a set of Intrinsic Mode Functions from the physical signal comprises:

recursively sifting the physical signal via Empirical Mode Decomposition to extract an intrinsic mode function indicative of an intrinsic oscillatory mode;

generating a residual signal by subtracting the intrinsic mode function from the physical signal;

treating the residual signal as the physical signal during a next iteration of said recursive sifting step; and

iterating to perform said recursive sifting to generate an n-th intrinsic mode function of an n-th intrinsic oscillatory mode until a stopping condition is met.

8. (Currently amended) The computer implemented method of analyzing a physical signal according to claim 7, wherein said recursive sifting includes:

identifying local maximum values in the physical signal ;

constructing an upper envelope of said physical signal from the identified local maximum values;

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identifying local minimum values in said physical signal;
constructing a lower envelope of said physical signal from identified local minimum values;
determining an envelope mean from the upper and lower envelopes;
generating a component signal by subtracting the envelope mean from said physical signal;
treating the component signal as the physical signal; and
recursively performing said sifting until successive component signals are substantially equal.

9. (Currently amended) The computer implemented method of analyzing a physical signal according to claim 8, wherein the step of constructing a lower envelope of the physical signal includes connecting the identified local minimum values with straight lines; and the step of constructing an upper envelope of the physical signal includes connecting the identified local maximum values with straight lines.

10. (Currently amended) The computer implemented method of analyzing a physical signal according to claim 8, wherein the step of constructing a lower envelope of the physical signal includes connecting the identified local minimum values with cubic spline fitting; and the step of constructing a upper envelope of said physical signal includes connecting the identified local maximum values with cubic spline fitting.

11. (Canceled)

12. (Canceled)

13. (Currently amended) The computer implemented method as in claim 4 further comprising: the step of summing up the mean frequency functions.

14. (Original) The computer implemented method as in claim 13 further comprising the step of:

displaying the sum of the mean frequency functions.

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15. A computer implemented method of analyzing a physical signal from a physical device comprising the steps of:

a. inputting the physical signal;

b. extracting a set of Intrinsic Mode Functions from the physical signal;

c. generating an instantaneous frequency based on critical points of the signal by generating a set of mean frequency functions from the Intrinsic Mode Functions, wherein the step of generating a set of mean frequency functions includes computing the mean frequency at a point along the time scale for one of the Intrinsic Mode Functions;

d. continuing to perform the computing step for all of the Intrinsic Mode Functions; and,

e. displaying said instantaneous frequency.

16. (Currently amended) The computer implemented method as in claim 15, wherein the mean frequency at a point under consideration is a weighted mean frequency.

17. (Cancel)

18. (Currently amended) The computer implemented method as in claim 15, wherein extracting a set of Intrinsic Mode Functions from the physical signal comprises:

recursively sifting the physical signal via Empirical Mode Decomposition to extract an intrinsic mode function indicative of an intrinsic oscillatory mode;

generating a residual signal by subtracting the intrinsic mode function from the physical signal;

treating the residual signal as the physical signal during a next iteration of said recursive sifting step; and

iterating to perform said recursive sifting to generate an n-th intrinsic mode function indicative of an n-th intrinsic oscillatory mode until a stopping condition is met.

19. (Currently amended) The computer implemented method of analyzing a physical signal according to claim 18, wherein said recursive sifting including:

identifying local maximum values in the physical signal;

constructing an upper envelope of the signal from the identified local maximum values;

identifying local minimum values in the physical signal;

constructing a lower envelope of said physical signal from the identified local minimum values;

determining an envelope mean from the upper and lower envelopes;

generating a component signal by subtracting the envelope mean from said physical signal;

treating the component signal as the physical signal; and

recursively performing said sifting until successive component signals are substantially equal.

20. (Currently amended) The computer implemented method of analyzing a physical signal according to claim 19, wherein the step of constructing a lower envelope of the physical signal includes connecting the identified local minimum values with straight lines; and the step of constructing an upper envelope of the physical signal includes connecting the identified local maximum values with straight lines.

21. (Currently amended) The computer implemented method of analyzing a physical signal according to claim 19, wherein the step of constructing a lower envelope of the physical signal includes connecting the identified local minimum values with cubic spline fitting; and the step of constructing a upper envelope of said physical signal includes connecting the identified local maximum values with cubic spline fitting.

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